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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,634	10/07/2005	Martyn Vincent Twigg	JMYT-347US	2199
95567	7590	06/09/2010		
RatnerPrestia (JM)			EXAMINER	
P.O. Box 980			NGUYEN, TU MINH	
Valley Forge, PA 19482-0980				
			ART UNIT	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/527,634	<b>Applicant(s)</b> TWIGG ET AL.	
	<b>Examiner</b> TU M. NGUYEN	<b>Art Unit</b> 3748	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 March 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 13-21, 25, 30-34, 36 and 38-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 49-54 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 13-21, 25, 30-34, 36, 38, 40, 41 and 43-48 is/are rejected.
- 7) ☒ Claim(s) 3, 39 and 42 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20100315</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. An Applicant's Amendment filed on March 15, 2010 has been entered. Claims 1, 36, 41, 43, and 47 have been amended; and claims 49-54 have been added. Overall, claims 1-3, 13-21, 25, 30-34, 36, and 38-54 are pending in this application.

#### ***Drawings***

2. The drawings filed on October 15, 2007 have been approved for entry.

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1, 13-21, 25, 34, 36, 38, 40, 41, and 43-46 are rejected 35 U.S.C. 103(a) as being unpatentable over Deeba (U.S. Patent 6,912,847) in view of Sasaki et al. (U.S. Patent 5,890,360).**

Re claims 1, 34, 36, 41, 43, and 44, as shown in Figure 2, Deeba discloses a system and a process for operating said system, the system comprising:

- a diesel engine configured to operate in a first, normal running mode (low load mode) to produce exhaust gas, and in a second mode (high load mode or higher temperature mode),

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wherein when operating in the second mode, a value of at least one measurable parameter (exhaust gas temperature) indicative of a condition of the engine is outside a pre-determined range; and

- an exhaust system disposed downstream of the diesel engine for receiving the exhaust gas therefrom, the exhaust system comprising a catalyzed component comprising: (1) a flow-through, non-filtered substrate monolith (12) comprising a palladium (Pd) catalyst supported on a first support material (ceramic carrier) associated with at least one base metal promoter (cerium oxide) (see line 59 of column 8 to line 14 of column 9) and (2) a second substrate (15) comprising a filter which is disposed a platinum (Pt) catalyst (34) (see Figure 5 and lines 2-13 of column 10),

wherein the substrate monolith (12) is upstream of the filter (15) and the catalyzed component is catalyzed soot filter (15) having an oxidation catalyst (34).

Deeba, however, fails to disclose that the system further comprises a means to switch engine operation between the two modes solely in response to at least one of an exhaust gas temperature and catalyst bed temperature, wherein the second mode produces an exhaust gas comprising an increased level of carbon monoxide (CO) relative to the exhaust gas produced in the first mode.

As shown in Figure 1, Sasaki et al. disclose a compression ignition type engine that switches between a first combustion mode (I) and a second combustion mode (II) based on at least an engine load (L) of the engine (see Figure 11). As illustrated in Figures 10-11 and indicated on lines 5-25 of column 12, Sasaki et al. teach that it is conventional in the art to monitor an exhaust gas temperature in a combustion chamber (5); and that the second

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combustion mode is performed if an engine load is high, which causes the exhaust gas temperature becomes excessively high, wherein during the second combustion mode, an EGR rate is lowered and an engine air-fuel ratio is reduced with higher loads, which results in a reduction of soot (see the Abstract and Figure 5) and an increase of CO level in an exhaust gas stream (see Figure 2). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Sasaki et al. in the system and process of Deebea, since the use thereof would have been routinely practiced by those with ordinary skill in the art to minimize harmful soot emissions in the exhaust gas stream.

Re claim 13, the modified system of Deebea further comprises an engine control means, wherein the engine control means comprises an engine control unit (not shown but obviously must have).

Re claim 14, in the modified system of Deebea, the means for switching between the two modes switches between the first mode and the second mode when the temperature of the supported Pt catalyst is  $< 250^{\circ}\text{C}$  (see at least lines 6-13 of column 14).

Re claim 15, in the modified system of Deebea, the Pd catalyst and the Pt catalyst are both disposed on the same support material (ceramic carrier).

Re claims 16-21, in the modified system of Deebea, the at least one base metal promoter is selected from a reducible oxide, wherein the at least one reducible oxide is selected from the group consisting of  $\text{MnO}_2$ ,  $\text{Mn}_2\text{O}_3$ ,  $\text{Fe}_2\text{O}_3$ ,  $\text{SnO}_2$ ,  $\text{CuO}$ ,  $\text{CoO}$ , and  $\text{CeO}_2$  and mixtures thereof (see lines 10-12 of column 9), wherein the reducible oxide is dispersed on the first support material (ceramic carrier).

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Re claims 25 and 40, in the modified system and process of Deeba, the first support material is selected from the group consisting of alumina, silica-alumina, ceria, magnesia, titania, zirconia, a zeolite, and mixtures, composite oxides or mixed oxides of any two or more thereof (see lines 3-6 of column 9).

Re claim 38, in the modified system of Deeba, the Pt catalyst is supported on a second support material (lines 17-19 of column 8).

Re claim 45, in the modified system of Deeba, the substrate monolith further comprises a second platinum (Pt) catalyst (see lines 3-14 of column 9).

Re claim 46, in the modified system of Deeba, the catalyzed component is the NO oxidation catalyst whereby the filter is located downstream of the catalyzed component (see lines 15-23 of column 9).

**5. Claims 2, 32, 48 and 30, 31, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deeba in view of Sasaki et al. as applied to claims 1 and 38, respectively, above, and further in view of legal precedent.**

Re claims 2 and 48, the modified system of Deeba discloses the invention as cited above, however, fails to disclose that the engine is configured to produce exhaust gas comprising more than 2000 ppm CO when running in the second mode.

Deeba discloses the claimed invention except for specifying an optimum range of carbon monoxide concentration of more than 2000 ppm to regenerate the catalyzed soot filter. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a specific optimum range of CO concentration, since it has been held that where the

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general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Re claims 30-33, the modified system of Deeba discloses the invention as cited above, however, fails to disclose that the catalyzed component comprises from 30 to 300 gr/ft<sup>3</sup> Pd and from 30 to 300 gr/ft<sup>3</sup> Pt, a supported catalyst part of the catalyzed component contains from 0.1 to 30.0% by combined weight of Pt and Pd based on the combined total weight of the supported Pd catalyst and the supported Pt catalyst, the supported catalyst part of the catalyzed component contains a weight ratio of from 95:5 to 10:90 Pd :Pt, or the supported catalysts contain from 0.1 to 10% Pt by weight and from 0.1 to 20% Pd by weight based on the combined total weight of the supported catalysts.

Deeba discloses the claimed invention except for specifying an optimum range of Pt and Pd densities, percentage weight, and weight ratio. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a specific optimum range of Pt and Pd densities, percentage weight, and weight ratio, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

**6. Claim 47 is rejected 35 U.S.C. 103(a) as being unpatentable over Deeba in view of Russell (U.S. Patent 6,253,543).**

As shown in Figure 2, Deeba discloses a system comprising:

- a compression ignition engine configured to operate in a first, normal running mode (low load mode) to produce exhaust gas and in a second mode (high load mode or higher temperature mode), wherein when operating in the second mode, a value of at least one

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measurable parameter (exhaust gas temperature) indicative of a condition of the engine is outside a pre-determined range;

- an exhaust system disposed downstream of the compression ignition engine for receiving the exhaust gas therefrom, the exhaust system comprising a catalyzed component comprising (1) a first substrate comprising a first filter (12) and a palladium (Pd) catalyst supported on a first support material (ceramic carrier) associated with at least one base metal promoter (cerium oxide) (see line 59 of column 8 to line 14 of column 9); and (2) a second substrate comprising a second filter (15) and a platinum (Pt) catalyst (34) see Figure 5 and lines 2-13 of column 10).

Deeba, however, fails to disclose that the system further comprises a means to switch engine operation between the two modes in response to at least one of an exhaust gas temperature or catalyst bed temperature, wherein the second mode produces an exhaust gas comprising an increased level of carbon monoxide (CO) relative to the exhaust gas produced in the first mode.

As shown in Figure 1B, Russell discloses a lean catalyst and particulate filter control for an exhaust system of a diesel engine (170) comprising a particulate filter (95) and a lean NO<sub>x</sub> trap (97). As illustrated in Figure 4, Russell teaches that it is conventional in the art to monitor (in step 412) a filter temperature (T<sub>p</sub>); and a regeneration of the filter is initiated (in step 416) if T<sub>p</sub> is greater than a threshold value (T<sub>2</sub>) and an amount of particulate matter in the filter exceeds S<sub>2</sub>, wherein during the regeneration, an excess fuel is injected by an injector (80) during at least one of power stroke and exhaust stroke (lines 23-29 of column 3), which results in an increase of CO level (see lines 56-57 of column 5). It would have been obvious to one having ordinary skill



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in the art at the time of the invention was made, to have utilized the teaching by Russell in the system of Deeba, since the use thereof would have been routinely practiced by those with ordinary skill in the art to save fuel and increase a purification efficiency of the filter (see lines 5-14 of column 2).

***Allowable Subject Matter***

7. Claims 49-54 are allowed.

Claims 3, 39, and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

8. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are moot in view of the new ground(s) of rejection.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Prior Art***

10. The IDS (PTO-1449) filed on March 15, 2010 has been considered. An initialized copy is attached hereto.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of two patents: Iihoshi et al. (U.S. Patent 6,772,585) and Coleman et al. (U.S. Patent 7,661,263) further disclose a state of the art.

*Communication*

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Tu M. Nguyen/

TMN

Tu M. Nguyen

June 4, 2010

Primary Examiner

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